## $Table\ of\ Contents$

Preface	ii
Executive Summary	iii
Table of Contents	vi
List of Figures and Tables	X
Acronyms and Abbreviations	xi
Contaminant Assessment Process	1
Kenai National Wildlife Refuge	3
Contaminant Sources and Issues	7
Oil and Gas Development	8
Swanson River Field	8
Major Spills and Contamination Events Reported at Swanson River Field	9
Flowline Break - 1961	
Diesel Fuel and Engine Oil Leak - 1963	
Flowline Break - April 18, 1969	
Contamination from Drilling Operations - 1968	9
Compressor Plant Explosion - January 27, 1972	9
Gas Blow Out - 1986	13
Xylene Release at Pipe and Supply Yard - 1988	
Flare Stacks and Tank Setting Contamination - 1989	
Flowline Leak - 1991	
Flowline Break - 1994	
Flowline Break - 1995	
Flowline Break - 1999	
Underground Pipeline Leak - 1999	
Beaver Creek Field	18
Major Spills and Contamination Events Reported at Beaver Creek Field	19
Discovery Well Blow Out - February 1967	19
Tanker Rollover Spill - 1981	19
Tank Farm Spill - 1988	19
Diesel Spill - 1990	20
Tanker Loading Spill - 1993	
Tanker Leak - 1993	21
Summary: Oil and Gas Development	22

Additional Potential Contamination Events and Sources from Oil and Gas Development _	25
Drilling Muds and Reserve Pits	26
Injection Wells	
Explosions	28
Fires	
Transformers	
Mercury Manometers	29
Seismic Exploration	
Summary: Additional Potential Contamination Events and Sources from Oil and	
Gas Development	30
Pesticides	31
Dybar	31
2,4-D, 2,4,5-T and Dioxin	32
Pentachlorophenol	32
Summary: Pesticides	
Formerly Used Defense Sites	35
Skilak Military Recreation Site	38
Naptowne Radio Relay Site	
Turnagain Arm Firing Range	
Wildwood Station_	
Other Military Activities	36
Summary: Formerly Used Defense Sites	
Development Near the Refuge Boundaries	38
Industrial Sources	38
Air Quality	
Stormwater Drains and Other Discharges	
Sterling Highway and Other Roadways	
Power Lines	
Other Sources	4
Summary: Development Near the Refuge Boundaries	48
Mining	44
Surprise Creek Gold Mining Site	44
Indian Creek Mining Area	
Other Mining Locations	
Summary: Mining	
Waste Disposal	48
Waste Burial and Repository	
Recreational Vehicle Dump Station and Evaporation Lagoon	
Waste Disposal at Swanson River and Beaver Creek Fields	
Summary: Waste Disposal	

## **Table of Contents**

Hunting a	nd Fishing	51
Snowmobi	ile Use	51
_		
Summary	: Recreational Uses	53
Fires and Fire	e Retardants	54
Summary:	: Fire and Fire Retardants	55
Inholders		56
Caribou Is	sland Inholding	56
	Native Corporation Inholdings and Other Inholdings	
Summary	: Inholders	56
Aircraft Accid	lents	58
Biotic Sources	s and Physical Transport of Contaminants	59
Areas of Conc	ern and Future Sampling Needs	60
Area of Co	oncern: Unnoticed Contamination Events	60
	oncern: Oil and Gas Development	
Future Sa	ampling Needs and Potentially Contaminated Areas	60
Conclusion		63
Bibliography and	Literature Cited	65
Appendices		75
Appendix A:	Petroleum Toxicity	75
Appendix B:	A Summary of Reported Hydrocarbon Spills for Swanson River and Beaver Creek Operating Units 1957-February 1999	76
Appendix C:	Polychlorinated Biphenyl Toxicity	83
Appendix D:	Xylene Toxicity	84
Appendix E:	Mercury Toxicity	85
Appendix F:	Manometer Locations, Contamination Detected and Amount of Mercury in Use at Each Location	
Appendix G:	Pesticides Used on Kenai National Wildlife Refuge	
	Dybar	
	2,4-D	
	2,4,5-T	
	Pentachlorophenol	
A 31 TT		
Appendix H:	Dybar Application Locations and Treatment Results	110

## Table of Contents

Appendix I:	2,4-D and 2,4,5-T Application Locations and Treatment Results	112
Appendix J:	Mining Information for Alaska	114
Appendix K:	Material Safety Data Sheets for Phos-Chek® Fire Retardant Grades D-75F and D-75R	116
Appendix L:	Material Safety Data Sheet for Fire-Trol LCG-F	121